Does military expenditure crowd out private investment? A disaggregated perspective for the case of France ☆

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ABSTRACT

This article explores the effects of military expenditure on private investment in France, for the period between 1980 and 2010. Using a Keynesian model, our empirical results reveal that military spending crowds out private investment, a result commonly accepted in the literature. However, our approach is original in that we use disaggregated data. Such an approach distinguishes between the effects of non-equipment expenditure which crowds out investment and those of equipment expenditure which crowds in investment. As a result, we show that military equipment and private investment are complementary to one other.

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1. Introduction

French defense policy is somewhat unique in Europe. The French "grandeur policy" (Fontanel and Hébert, 1997) has been the main defense policy characteristic since the Vth Republic and is based on the independence vis-à-vis the US (e.g. nuclear deterrence, ambiguous position concerning NATO and fairly interventionist position in conflicts). Consequently, the defense policy implies important budgetary means, with potential substantial macroeconomic impact. The aim of this paper is to provide empirical evidence regarding a major macroeconomic issue: the relationship between military spending[1] and investment.

Various figures help to illustrate this size of the defense budget in France and more generally on the defense sector. Between 1960 and 2010, the defense burden, calculated as the ratio of defense spending to GDP, is equal to 3.6% and the share of military expenditure in public spending exceeds 20%. The French Defense Statistical Yearbook (2013) also shows that the share of the armament industry in manufacturing is equal to 8.4% in 2008 and has risen since 1998. The Defense Ministry employs 8% of the public workforce. The net exports of the armament industry are positive and the only economic sector with a positive balance.

Evaluating the macroeconomic impacts of defense is quite difficult. Changes in defense spending have potentially major effects as shown by Ramey (2011) in the US case. Such changes are easier to identify because they directly correspond to periods of conflict. France is not as involved as the US in terms of war and so the concept of opportunity cost is relevant here. For example, consider the opportunity cost of a forgone investment: defense spending crowds out private investment because both elements compete for the same pool of resources through increasing budget deficit and interest rates. Smith (1980, p. 20) further justifies that "military equipment is produced by capital-goods industries", so that changes in defense spending directly affect private investment with an inelastic capacity.

The links between military expenditure and investment are important for economic policy because investment appears to be a crucial determinant to growth. Levine and Renelt (1992) argue that the investment ratio is the unique determinant that is unambiguously robust. Recently, Bond et al. (2010) provide a panel data examination of the links between investment and long run growth. They indicate that capital accumulation has a major and statistically significant effect, even if this evidence is not so strong for OECD countries. Given these constraints and the economic importance of defense expenditure, it is crucial to quantify the defense–investment relationship. Surprisingly, this article is the first to do so.

Another remarkable feature of French defense spending is the composition of the defense budget. Indeed, the military sector constitutes the first public "investor". Table (1) presents, in billions of euros, the public budget, the central public investment budget, the defense equipment budget — mainly considered as public investment — and the share

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[1] In this article, the terms "defense" and "military" are interchangeably.

Table 1
French budget (in billions euros).

Period	Budget	Central public investment (a)	Defense equipment (b)	(b)/(a)
1980–1985	134.92	10.31	8.80	85.84
1985–1990	200.14	16.33	13.47	82.40
1990–1995	257.14	20.32	15.81	77.79
1995–2000	298.78	20.29	13.43	66.22
2000–2005	345.80	22.66	12.94	57.10
2005–2010	400.37	25.27	15.84	63.11
Average	276.97	19.39	13.46	71.79

of defense equipment in public investment. Data are provided by the French national statistical institute (INSEE) and Defense ministry.

From the previous table, we note that defense equipment constitutes a major part of central public investment; the share of defense equipment in public investment exceeds 70% on average over the period 1980–2010 even if this share is decreasing over time. It is important to remark that global public investment is principally composed by local public investment. Central public investment represents only 20% of public investment in the last few years.

Moreover, the composition of military expenditure reveals that defense equipment is on average equal to 50% of defense budget. As stated by Smith (2009), France spends an important part of its budget to equipment compared to other developed countries. The relationship between the procurement agency, the *Direction Générale de l'Armement* (DGA) and French Defence Technological and Industrial Base is privileged. The ties are also underlined regarding the origin of the defense equipment. Data are quite difficult to find to illustrate the international arms trade over time. French parliament report on arms exports provides information between 2002 and 2012 and indicates that imports represent 1.07 billion of euros, meaning that 90% of defense equipment is realized in France and by French firms.[2] SIPRI database regarding trade is also useful through TIV (Trend Indicator Values) data. On average between 1980 and 2010, imports are equal to 8% of exports.[3] As a consequence, the economic impact in France is potentially higher than in countries which need to import their equipment given the importance of the French defense industry in the provision of defense equipment.

The crucial role of defense spending in the provision of public investment may question the conventional crowding-out hypothesis. From a theoretical point of view, two opposite forces arise: higher public investment leads to a higher capital accumulation rate above the optimal rate and so crowds out private investment, but public investment, and in particular infrastructures, can positively contribute to private productivity and so leads to a complementarity nexus. Aschauer's (1989) study is a starting point for many controversial articles concerning this issue.

Consequently, the crowding-out hypothesis may be challenged by composition effects. Given the weight of military sector in the provision of public investment, it is also possible to get two contradictory effects: on the one hand, the potential crowding-out effect associated with the non-equipment budget and on the other hand, the potential crowding-in effect associated with the equipment budget.

The aim of this article is to shed light on this argument. To discuss this issue, we examine the case of France with disaggregated data over the period 1980–2010. Our approach is original in three ways: (i) this is the first study dealing with the defense–investment relationship in France, (ii) we exploit disaggregated data in order to decompose contradictory effects and (iii) the empirical results use several robust methods.

This paper is organized as follows. In the next section, the literature review is presented with special attention paid to the case of France. Then, we analyze Smith's model (Smith, 1980). In the fourth section, we examine the data used in this empirical work. Section 5 presents the results obtained from the cointegration regressions for both the baseline and the augmented models and finally, the last section concludes the paper concentrating on the defense policy implications.

2. Literature review

In defense economics, much attention has been paid to the defense–growth relationship. Since the work of Benoit (1973), the debate is far from being complete. Due to the multiplicity of theoretical frameworks, econometric approaches and analyzed countries, results vary widely. Dunne et al. (2005) illustrate that there is no clear consensus. Previous literature reviews obtain the same conclusion (see Ram, 1995; Chan, 1985).

This absence of consensus can be explained by the multiplicity of channels by which defense spending affects growth. To sum up and in accordance with Dunne et al. (2005), three channels are plausible. The first channel relies on Keynesian theory with two contradictory effects, one stimulatory caused by the multiplier (for an empirical evaluation, see Atesoglu, 2002) and one depressing caused by the crowding-out. The second channel lies with the competition between resources: defense spending implies positive spillovers through technological progress but also negative impacts through waste. The last channel consists in the provision of security. The lack of security may retard the growth process but excessive defense spending could be perceived as a danger. Ades and Chua (1997) show how military expenditure contributes to regional instability, which is a negative determinant of growth.

However, as noted by Sandler and Hartley (1995), if the global literature is rather inconclusive concerning the impact of defense spending, consistent conclusions appear when articles are classified according to the underlying model used by researchers. A large part of the literature focuses on the defense–investment nexus and concludes that, in accordance with theoretical expectations, military expenditure crowds out private investment.

In order to evaluate the influence of military spending on investment, Smith (1980) develops a model widely used in the empirical literature. The idea is that defense expenditure and investment are in competition for a common pool of scarce resources. Consequently, a rise of military spending inevitably leads to crowd-out investment.

Smith (1980) uses time series, cross-section and pooled data for OECD countries in order to test the crowding-out hypothesis. He shows that, whatever the econometric approach, defense expenditure crowds out investment with a coefficient equal to −1. This confirms a previous study (Smith, 1977) for a smaller sample of OECD countries.

Smith's model, also called the "demand model" by Sandler and Hartley (1995), serves as a basis for a number of studies dealing with the defense–investment relationship. For instance, Gold (1997) examines the US case over the period 1949–1988 and founds that the crowding-out hypothesis is not rejected for the period 1949–1971 but there is a trade-off that relies military expenditure and private consumption rather than private investment.[4] Scott (2001) evaluates the defense–investment relationship for UK and clearly identifies the crowding-out phenomenon. Atesoglu (2004) uses a different model for the US case between 1947 and 2001 and findings do not show a kind of trade-off between military expenditure and private investment.

As for France, there are only a few studies in the field of defense economics. This may be surprising given the particularity of French defense policies, namely nuclear deterrence, independence vis-à-vis NATO and national weapon production. The end of the Cold War leads to a

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[2] The Defense Statistical Yearbook (p. 64) details the main providers, namely Dassault, DCNS, NEXTER, SAFRAN, SNPE, THALES and Renault Trucks.

[3] According to TIV, French imports are equal to 3.76 billions euros between 1980 and 2010. Even if the TIV method is not based on effective cost, this figure can be compared with the equipment budget equal to 417 billions euros, so that imports do not exceed 1% of defense equipment. More detailed data are available upon request.

[4] See Pieroni (2009) for a recent analysis of the defense-private consumption relationship.